

Development of specific coordination abilities and vestibular stability in the course of physical training of cadets of National Academy of the National Guard of Ukraine

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Purpose: to develop and to check experimentally ways of increase in specific coordination abilities of cadets of NANGU.

Material & Methods: analysis and synthesis of references, pedagogical observations, testing, test of Yarotskyi; pedagogical experiment; modeling. Cadets of 2 and 3 courses of NANGU participated in the research.

Results: the specific coordination abilities, which are shown at cadets of NANGU in the course of the solution of motive problems of military-applied orientation, are defined; the technique of definition of vestibular stability and assessment of its results on data of the test of Yarotskyi is mastered; the efficiency of experimental training of method of vestibular stability of cadets of NANGU is developed and defined.

Conclusions: the expediency of introduction in the educational process on physical training of cadets of NANGU of experimental training of method of vestibular stability is proved.

Keywords: specific coordination abilities, vestibular stability, cadet, physical training, teaching.

Introduction

The present time demands training of the highly professional experts of National Guard of Ukraine, who are capable for effective implementation of orders of command, therefore the development of specific coordination abilities in the course of physical training of cadets of NANGU plays the important role. Physical training occupies one of the leading positions in the educational process of NANGU. The main task of the educational-training process in NANGU is the development in cadets of physical qualities of specific orientation. Considering features of the professional activity of future officers of National Guard of Ukraine, it is considered necessary the improvement at cadets of specific coordination abilities whom treat time sense, attention, sensor-motor reactions, fast and dexterous movements.

The purpose of the research:

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Material and Methods of the research

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Results of the research and their discussion

The research was based on the works of A. P. Efremov but other, 2008 [4]; V. L. Botyayev, 2012 [1]; R. H. Dyeushev, 2012 [3];

Ye. Ye. Vityutnev, K. Yu. Chernishenko 2013 [2]; A. S. Rovnyi but other, 2014, 2015 [6; 7]; V. M. Platonov, 2010 [5] and other scientists. The analysis of scientific literature found the insufficient extent of the development of problem of development of specific coordination abilities in the course of physical training of cadets which demands the separate scientific research. It also defined the relevance of the article.

The coordinated functioning of tissues, bodies and systems of bodies, at their joint activity in organism as coordination in physiology it is understood at the same time and consistently [8]. The leading role in manifestation of coordination belongs to the central nervous system which accumulates information on state and changes in tissues and bodies at action both external, and internal environments. Thanks to innervations, the central nervous system is capable to provide interrelation between all parts of body and on this basis the coordinated activity of organism in general. At the same time it provides as the simultaneous, that is coordinated activity of bodies and tissues at every moment, and consecutive coordination. The role of mechanisms of coordination of motive functions and mechanisms of coordination of vegetative functions during the solution of different motive tasks can significantly differ. At the solution of one motive tasks, the important mechanisms of coordination of mainly motive function of the person, at the solution of others – mainly vegetative, at the solution of the third – both motive, and vegetative functions. In the first case coordination of processes is formed and improved, which proceed in mechanisms of innervations of muscles by means of which the motive task is solved. It is noted [8, p. 32] that the person can have essential vegetative changes at the pronounced emotional states at the solution of motive tasks. The role of mechanisms of coordination of

vegetative functions rises if the motive task is solved with the participation of large number of large muscles. At the same time cures of motive tasks, that is physical actions, differ with the performance duration, work power, and also constancy, or variability of conditions of their performance. At the solution of motive tasks, vegetative functions of organism provide activity of the corresponding muscles. Therefore, coordination of activity of organism is understood as the interrelation of motive and vegetative functions.

Experts allocate and consider coordination of movements as general characteristic of course of the movement in time and space (motive aspect), and coordination abilities – as internal determinants of coordination of movements, or its quick aspect. At the same time the general, specific and special coordination abilities differ [9]. Specific coordination abilities characterize properties which determine preparedness of the person for optimum control similar by origin and sense by the movements, and also to their regulation. Special coordination abilities concern to groups of complete purposeful physical actions, uniform by psychophysiological mechanisms, which are systematized by the growing complexity. The set of special and specific coordination abilities is called the general coordination abilities.

To the most important specific coordination abilities are treat: abilities to the accuracy of reconstruction, differentiation, measuring off and assessment of spatial, time and power parameters of movements; to balance, rhythm, quick response, orientation in space, quick reorganization of motive activity, and also to any relaxation of muscles, vestibular firmness, communication or connection.

Definition of specific coordination abilities which are shown by cadets of NANGU at the solution of motive tasks of the military-applied orientation their purposeful development allows to increase efficiency of the process of physical training of future officers.

Dysfunction of vestibular sensory system of the person leads to loss of ability to be guided in space as a result of violation of visual and acoustical perception, loss of tactile sensitivity. Vestibular frustration is observed at the military personnel of National Guard of Ukraine during the implementation of orders what are connected with vibration danger. Vestibular frustrations are quite often so strongly expressed that the person loses working capacity for long time, and in certain cases becomes completely not professional suitable.

One of the fixed assets of prevention of vestibular dysfunction among cadets of NANGU is training of vestibular firmness – vestibular gymnastics which includes different exercises on the movements of eyes, head, and also trainings of coordination abilities.

The training of vestibular firmness by means of special exercises promotes the decrease in percent of future officers who suffer from vestibular frustration.

The high level of coordination abilities allows the cadet to seize quickly new movement skills; it is rational to use the available stock of skills and motive qualities – force, speed, and flexibility, to show necessary variability of movements according to concrete situations of professional activity. Coordination abilities are shown in the expedient choice of physical

actions on arsenal of the skills mastered by the cadet. Therefore, it is natural that the level of their manifestation depends on motive preparedness of the cadet, quantity and complexity of the mastered skills, and also efficiency, course of mental processes, which cause effective management of the movements. The bigger quantity, variety and complexity of the mastered skills is, the quicker and more effectively adapts the cadet to unexpected conditions, solves new motive tasks that react more adequately according to requirements of situation, which arises. Speed and efficiency of the solution of motive tasks, in turn, increase motive stock of the cadet. Together with it, coordination abilities are in many respects caused by efficiency of the cadet in processing of information, which arrives from the external environment. Specific requirements to coordination abilities and activity of analyzers represent exercises in the conditions of confidants to fighting (on obstacle course, in field conditions, at passing physical training, in the conditions of execution of alerts) as features of work in these conditions complicate process of control and management of the movements. Information, which is obtained from analyzers, allows the cadet of NANGU to perceive precisely the smallest details of movements, provides their analysis and necessary correction. Special impact is exerted by specialized perceptions on coordination abilities of the cadet – space sense, water obstacle; fighting vehicle by which level of development in many respects the speed of management of the movements is defined.

Simple coordination and rotary tests with overstimulation of vestibular receptors are used for research and assessment of condition of vestibular firmness.

The simplest test is the test of professor V. Ya. Yarotskyi among rotary tests.

The examinee carries out the circular (rotary) movements by the head in one side with speed of 2 rotations in 1 second. On time during which the surveyed is able to execute this test, keeping balance, judge firmness of vestibular analyzer. Unexercised people keep balance on average during 28 s, sportsmen – to 90 s and more.

The reaction is estimated on trunk deviation degree aside and existence of vegetative symptoms: pale persons, increase of pulse, perspiration, nausea, but other.

Safeguarding is provided when performing this test.

Cadets of the 2 and 3 courses of NANGU participated in the research. 3 groups were created: one experimental group (EG) which was engaged by the experimental training method of vestibular firmness, two control groups (CG-1 and CG-2) which were engaged by the standard technique. The experimental work was carried out within 4 months (from February to May in 2015) on physical training classes.

The training method of vestibular firmness included trainings of vestibular gymnastics, complex relays in which were used: run in the different ways, movement on limited support, throws over forward-back, and jumps with turns on 180° and 360°. Cadets were also recommended for the independent performance complexes of vestibular gymnastics.

The definition of condition of vestibular firmness of cadets was carried out at the beginning and at the end of the experiment.

The analysis of results of the first investigation phase allowed allocating conditionally the 3rd levels of vestibular firmness of students:

- high (H) – more than 32 s;
- average (A) – 26 – 31 s;
- low (L) – 25 s and less.

The percentage ratio of levels of vestibular firmness of cadets of NANGU at the beginning and at the end of the experiment is presented in the table 1.

Dynamics of change of distribution of cadets by levels of vestibular firmness before and after the experiment is presented in tab. 2.

The essential growth of number of cadets with the high level of vestibular firmness – from 12 to 22 persons was observed, the number of cadets with the average level of vestibular firmness grew by 7 persons and, respectively, the number of cadets with the low level of vestibular firmness decreased by 17 persons at the end of experiment.

The distribution of specific weight of cadets of three groups by levels of vestibular firmness before and after the experiment is presented in tab. 3.

The number of cadets with the high level of vestibular firmness (26,09%) considerably increased in the experimental group after carrying out the experiment. The number of cadets with the average level of vestibular firmness increased on 8,70% and the number of cadets with the low level of vestibular firm-

ness decreased on 34,78%. The last indicator is significantly lower, than in control groups where decrease makes 20,83% and 17,39% respectively.

T-criterion of Student was used for the definition of the statistical importance of differences. The carried-out calculations indicate reliability of differences in indicators in all groups of cadets who participated in the research.

The analysis of results of testing showed advantages of experimental training method of vestibular firmness of cadets of NANGU in comparison with traditional.

Conclusions

1. The analysis of references showed that problems of vestibular firmness and development of specific coordination abilities of the military personnel in general and the cadets of NANGU, in particular, are studied insufficiently.

2. The main features of the exercises directed to the improvement of coordination abilities is complexity, not traditional character, novelty, possibility of various and unexpected solutions of motive tasks. It is possible to diversify performance of habitual physical actions due to introduction of unusual first positions, variability of dynamic, time and spatial characteristics of movements, creation of unexpected situations by change of places of classes and conditions of their carrying out, use of training devices, and the special equipment.

3. The developed training method of vestibular firmness of

Table 1

Distribution of cadets by levels of vestibular firmness before and after the experiment (the number of persons)

Group	Before the experiment			After the experiment			Deviation (+;-)		
	L	A	H	L	A	H	L	A	H
CG-1	13	6	5	8	9	7	-5	3	2
CG-2	12	8	3	8	10	5	-4	2	2
EG	11	8	4	3	10	10	-8	2	6
Total	36	22	12	19	29	22	-17	7	10

Table 2

Rates of gain of number of cadets by levels of vestibular firmness after the experiment in comparison with data before the beginning of the experiment, %

Group	Rates of gain		
	L	A	H
CG-1	-38,46	50,00	40,00
CG-2	-33,33	25,00	66,67
EG	-72,73	25,00	150,00

Table 3

Distribution of cadets behind levels of vestibular firmness to and after the experiment (specific weight of %)

Group	Before the experiment			After the experiment			Deviation (+;-)		
	L	A	H	L	A	H	L	A	H
CG-1	54,17	25,00	20,83	33,33	37,50	29,17	-20,83	12,50	8,33
CG-2	52,17	34,78	13,04	34,78	43,48	21,74	-17,39	8,70	8,70
EG	47,83	34,78	17,39	13,04	43,48	43,48	-34,78	8,70	26,09

cadets of NANGU allows to model the system and to solve the main tasks to development of coordination abilities:

- effective development of specific coordination means (preservation of balance, orientation in space, rational muscular relaxation);
- rational development and use of applied motive potential;
- improvement of functional condition of analyzers of cadets;
- increase in vestibular firmness of cadets to adverse fac-

tors;

- disclosure of the hidden reserves and permanent preservation of the received skills throughout long time.

Prospects of the subsequent researches in this direction. Studying of influence of vestibular firmness of cadets of NANGU on accuracy of their shooting from different provisions is provided.

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